Class: Course 16.682, also known as Momentum

Level: Undergraduate (freshmen and sophomores)

Credits: 6 units

Prerequisites: None

Lecturers: Professor Joel Voldman (voldman@mit.edu; office hour: R, 3-4pm, 38-530), Joe Steinmeyer PhD (jodalyst@mit.edu; office hour: M, 11am-12pm, 38-530), Barbara Hughey, PhD (bhughey@mit.edu), Marion Boulicault (marionb@mit.edu), Marc Graham, PhD (polo@mit.edu).

TAs (office hours): Office Hours begin Thursday, Jan. 12, and end Wednesday, Feb. 1 in 38-530.

<table>
<thead>
<tr>
<th>TAs (office hours)</th>
<th>1/12/17 in 4-153 – Sensors, Neuroethics</th>
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</thead>
<tbody>
<tr>
<td>Sarah Bricault (<a href="mailto:sbricau1@mit.edu">sbricau1@mit.edu</a>) (T, 11am-1pm; R, 5pm-7pm; F, 5pm-8pm)</td>
<td>Jamar Brooks (<a href="mailto:j388923r@mit.edu">j388923r@mit.edu</a>) (W, 11am-2pm; F, 12pm-3pm)</td>
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<td>Mark Chounlakone (<a href="mailto:mchoun95@mit.edu">mchoun95@mit.edu</a>) (M, 1pm-3pm; W, 8pm-10pm; Sat, 1pm-3pm)</td>
<td>Missy Lopez (<a href="mailto:vmlopez@mit.edu">vmlopez@mit.edu</a>) (T, 6pm-9pm; Sun., 7pm-10pm)</td>
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<tr>
<td>Blade Olson (<a href="mailto:bladeols@mit.edu">bladeols@mit.edu</a>) (R, 12pm-3pm; Sun., 2pm-5pm)</td>
<td>Sam VanCise (<a href="mailto:vancise@mit.edu">vancise@mit.edu</a>) (M, 7pm-10pm; Sat., 5pm-8pm)</td>
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Website: Course 16.682 in Stellar (IAP 2017)

Course description

Momentum is a course offered to freshmen and sophomores during MIT’s Independent Activities Period (IAP). It is designed to prepare students for a future in the fields of science and engineering. This year, in partnership the NSF Center for Sensorimotor Neural Engineering, we will explore the brain-computer interface to improve lives by connecting the brain with technology. The theme will be: *Explore the Brain Computer Interface – Control the World with Your Mind*. Students will work in small teams to construct a system that controls a robotic car in order to perform a task. Throughout the course students receive assistance in resume building, oral presentations, interviewing, and participate in a competition, poster presentation and networking event with industry representatives.

Goals

- Apply basic concepts of deterministic design to frame and develop potential solutions to complex engineering challenges facing the world today.
- Employ an interdisciplinary approach to problem solving by ensuring technical feasibility and considering cultural and social compatibility, economic implications, and environmental impacts of the solutions that they generate.
- Develop teamwork, communication and professional skills.

Course Structure

- Lectures (3-5pm)
  - 1/9/17 in 4-153 – Neuroengineering
  - 1/10/17 in 4-153 – Deterministic design, Project Management
  - 1/11/17 in 4-153 – Arduinos
  - 1/12/17 in 4-153 – Sensors, Neuroethics
  - 1/13/17 in 4-153 – Lecture (TBD)

- Workshops
  - 1/18/17 in 4-231 at 11:30am – Poster Presentation Workshop
  - 1/19/17 in 4-145 at 12:30pm – GECD Interviewing Workshop
  - 1/23/17 in 4-145 at 12:30pm – GECD Mock Interviews Group A
• Progress check-ins (Each team will choose a 30-minute timeslot)
  o 1/17/17 in 4-144 from 3pm-6pm – Design Review
  o 1/26/17 in 4-163 from 4pm-7:30pm – Progress Report

• Poster Presentation, Competition, and IACME Mixer
  o 2/2/17 from 12-6:30pm in various locations (see calendar) – Poster Presentation and Competition

**Grading**

Grades will be assigned to each student based on participation and performance on the following:

<table>
<thead>
<tr>
<th>Activity</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lecture Attendance</td>
<td>25%</td>
</tr>
<tr>
<td>Poster Presentation and Competition</td>
<td>25%</td>
</tr>
<tr>
<td>Workshop Attendance</td>
<td>10%</td>
</tr>
<tr>
<td>Survey Completion*</td>
<td>10%</td>
</tr>
<tr>
<td>Peer Review*</td>
<td>10%</td>
</tr>
<tr>
<td>Design Review</td>
<td>10%</td>
</tr>
<tr>
<td>Progress Report</td>
<td>10%</td>
</tr>
</tbody>
</table>

*All participants complete a skills survey at the beginning of the course that will help the staff form teams and an exit survey at the end of the course to allow students to provide feedback.

^Peer Reviews will be completed anonymously and will provide a space to give feedback to all team members. Each student will complete a peer review for each of his/her team members; likewise, each student will receive a peer review from his/her team members. Participation in the feedback will count towards the student’s overall grade.

**Resources**

• **Momentum Store** – Each team will get a $400 budget to purchase components needed for their project. Purchases will be made either online using a purchase form or in the Momentum Store. The store will be open starting on Friday, January 13 in the TSR² (16-159). A detailed guideline for making purchases, the purchase form and the list of items available at the store can be found in the Stellar website.

• **Communications Lab** - Great resource to brainstorm ideas and for writing, speaking, and visual design support for scientists by scientists. Each team/student is responsible to schedule an appointment with either the **EECS, BE** (group coaching available), or **NSE** communication lab fellows through the links provided for each (links also available on Stellar).

• **Libraries** – Bioscience and EECS librarians have put together a handy guide (available on Stellar) with useful links and material related to topics that Momentum covers. This guide is especially useful to conduct market research. For questions or to set up appointments with the librarians contact them directly: Phobe Ayers (Biosciences librarian, psayers@mit.edu), Courtney Crummet (EECS librarian, crummet@mit.edu).
Contact information

For technical and lecture-related questions please contact Prof. Voldman at voldman@mit.edu or any of the TAs for the course. For any other questions please contact: Deolinda Branch (drodrigu@mit.edu), Devan Monroe (monroed@mit.edu) or come by the Office of Minority Education in 4-107.